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Development of Digital Automated Irrigation using Dynamo Pump

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Abstract: Digital irrigation will be an efficient and effective way of controlling water to support and sustain water management for the crops and for better farming purposes. An innovative digital irrigation using Dynamo Pump has the potential to maintain the desired level of water and supply the needed amount of water for normal plant growth which is not currently available for the crops. This system if developed could possibly reduce over water application and wastages. Such system will be control and irrigate the water needed by the crops automatically 24 hours as per consumed by the plants and as well as environmental support such as evaporation will sustained and returned it back to the setted level point. The system will be used highly programmable arduinouno, solenoid valve and digital water level sensor to measure and sustain the irrigation water for crops growth. Every time the water drawdown from the set level point that detect by the digital water level sensor will be sent information to the arduinouno and it will instruct the Dynamo pump to pump up and irrigate water automatically as well as the solenoid valve will be automatically open. By using the system, it will be able to maintain and sustained the water needed by the crops regardless of changes or growth on the plant and environmental condition.

Keywords: Digital-Irrigation, Innovative Irrigation System, digital water level sensor, solenoid valve, Unique Farming, Modernization, efficient Irrigation system, water management, Automatic mechanism, under-ground water degradation.

Introduction

One important component of good farming practices is to have an improved and innovative irrigation system. Smart farming trends in the Philippines are now more to be considered in order to be competent and sustain our irrigation mechanization advancement then we will explore our innovative invention through adaptation, use, commercialization and convergence.

Advance irrigation system that can provide systematic and well-verse application to sustain and support crops needs without any further involvement of human intervention is one of the main prime purpose of this study. Modernization of technologies in the country is more quite gradually advance; hence we need to embrace such advancement of irrigation technologies in order for us to push through with the flow of development like with the other progressive countries.

Local farming system in the Philippines is always adopting the traditional way although advance irrigation technologies has long been introduce to the country, farmers always clinging old practices due to lack of technical know-how and unaffordable market price. Hence, such one of the problems that are always encountered by the farmers, therefore one of the innovative irrigation technologies that may develop and introduce in response to unanswered local farming problems is the innovative Digital Irrigation System using Dynamo Pump.

The innovative Digital Irrigation System using Dynamo Pump is locally available materials in the market that may financially affordable at reasonable price. This unique farming technique uses irrigation without any hassle and consumes lesser time and effort upon set up. The innovative Digital Irrigation system using Dynamo pump provides sustainable irrigation water for the crops needs and improves fruitful harvest. By adopting the system it benefits farmers in many ways, first it is more economical in terms of power consumptive use since it uses electrical type of energy, it is lesser cost as compared to gasoline or diesel which is cheaper; second, once the system is set up, it will maintained the water needed by the crops which controlling and avoiding crops water stress which tends to give productive harvest; and third, the system is controlling and managing the water application which avoiding over water application and minimizes water wastages and underground water degradation.

The Digital Irrigation System using Dynamo Pump is designed for rice production and the Dynamo Pump is installed to function as the pumping heart of the working system. Without the Dynamo pump it will not be functional since it uses electrical type source of energy or even power from solar power as its driving force.

The Dynamo pump is the appropriate machine that can fully improve and sustain the needed pressure for the operating irrigating system and automatically intact to supply water without any interruption due to its designed and built-in operating function.

Theoretically, the Digital Irrigation System using Dynamo Pump can fit perfectly in the gradual development of irrigation technologies in the local farming. While modernization can be seen as a luxurious investment and oftentimes difficult to afford, the Digital Irrigation system using Dynamo pump is less expensive. It is more practicable local materials use that can contribute to the advancement of farming system while being highly efficient and enormously reliable for greater yield.

It is towards this end that this study wishes to assess and examine the adaptability of a Digital Irrigation system using Dynamo Pump in the local farming setting.

Objectives

This study seeks to attain the following objectives:

1. To develop and install digital- automated irrigation using dynamo pump;
2. To test and evaluate the performance of the digital-automated irrigation system in terms of:
   2.1 Power consumption
   2.2 Volume of water discharge
   2.3 Efficiency, and;
3. To compare the profitability of the digital-automated irrigation using Dynamo Pump and traditional irrigation.

Methodology

This study is focused on the development and installation of digital- automated irrigation using dynamo pump. The water source is coming from the existing deep well in the area, and where the vertically submerging PVC inlet source line of the system is connected. The submerged PVC inlet is connected through the impeller of the dynamo pump, and its discharge pipeline is directly connecting to the main pipeline.

The digital-automated irrigation system will be installed based on the design formulated which has the main PVC pipeline-considered receiving and storing water for intact and immediate discharge of water every time the solenoid valve will open to irrigate and where the every sub pipelines are connected.The three solenoid valve which serves as controlling mechanisms for the flow of water going through the field application area will be connected with the digital automatic water level sensor. The *arduinouno* which serve as the main brain of the system will be directly connected with multi water level sensor and attached to the solenoid valve to redirect the water in its destination every time the level of the water in a particular area will be lower or below the required level of water. The *arduinouno* is directly connected to the pump to receive and disseminate information coming from the water level sensor and transmit that information to the pumps, which has an intact coordination with the solenoid valve as the controller mechanism of the system redirecting the water through its destination.

The system will be supplying water to the one hectare experimental area intended for rice production.

Summary

The proposed Digital Irrigation system using Dynamo Pump has the potential of optimizing the efficient use of water capable of controlling and managing the water application and minimizing the human effort. The proposed design using *arduinouno* as an automatic mechanism for the intact coordination with the solenoid valve and digital automatic water level sensor will be great help to our irrigation purposes which will be given farmers a free time to perform other works. The proposed develop DigitalIrrigation Using Dynamo Pump will be designed to facilitate the automatic supply of sufficient water from the deep wellinto the field of application.

The study will be maintained the water level that will be supplied with irrigation water from time to time by the innovative Digital-Automated Irrigation system.

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